

AUDITORY GUIDANCE IN OFFICER LEVEL TRAINING

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Students are apt to report feelings of tension or stress that can interrupt learning at all levels of education and training. It is generally accepted that learning is inhibited by stress to the degree of its intensity. Stress as noted will inhibit aspects of learning, and if it is too prolonged poses health concerns as well (McClelland, 1989). If a technique can be applied to lessen tension in the learning situation, then it follows that more effective performance will occur. Particularly, direct changes in test achievement, skill performance, and related attitudes might be experienced if a technology is used to lessen stress and heighten attention. Such a technology exists, as mentioned above, in the design of stereo-cassette tapes that provide a relaxed yet attentive state (Monroe, 1982). While some tape data exist suggesting stress is reduced and learning enhanced (Waldkoetter, 1983), particular positive changes in test achievement, skill performance and related attitudes have not been fully documented, or at least verified in differing academic or training settings.

The Monroe system (Monroe, 1982) as developed relies on audio-stimuli (sound frequencies) to induce a frequency following response (FFR), hearing sound pulses which respond with similar electrical brain signals. Certain sound patterns create states of awareness that will affect perception and behavior (Green, 1973). The sound pulses are further modified through brain wave synchronization of each hemisphere (Oster, 1973) creating another brain signal from sound pulses in each ear. With the sound pulses resonating with like brain signals, states of consciousness occur to enhance behavior of varying kinds. Two prior demonstrations using hemispheric synchronization (Hemi-Sync®) in a military setting have indicated acceptance by students and faculty for using such sound tapes without disrupting the academic/training process (Sternberg, 1982 and Waldkoetter, 1983).

METHOD

Another test unit was selected to explore tape use with officer-level students for analysis and evaluation. A Public Affairs Officer Course (PAOC) was selected at the Defense Information School (DINFOS), Fort Benjamin, Harrison, IN, requiring complex behaviors. The public affairs officers' training and job involves various pressures and skill demands across military community relations, public affairs communication and media, and broadcasting, and could be affected favorably by technology reducing stress and enhancing learning. This test using PAOC #1-91 was considered feasible by DINFOS in view of the uncomplicated technology, no class schedule disruptions, and test objectives. The following three test objectives were to be evaluated:

1. Determine if the auditory guidance (Hemi-Sync) process increases and augments subject-matter learning as reflected by test scores, exercises and related measures.
2. Determine if other learning experiences are positively affected by the use of the

Hemi-Sync process as reflected by training exercises and related measures.

3. Determine if other positive behavioral experiences are activated by the Hemi-Sync process as reflected by training exercises and related measures.

Approach

The training technology was made available to test class, PAOC #1-91, in an initial volunteer sample of 23 officer and selected civilian students (13 male/10 female) out of 44 students during 10 October to 14 December 1990 for about 10 weeks. It was decided to have students use six tapes to prepare prior to four scheduled course tests and exercises. The six tapes were to be used before study and during study, before and after testing, since the volunteer students were interested in improving overall course performance. All armed forces were represented in the test class with the class divided into two groups, a test and a control group. The control group would receive only faculty counseling as usually given, and the test group would have sound tape exposure and faculty counseling. Another control group was planned for reference using prior graduated classes for course content comparisons. The sound tapes presented some voice instruction and stereo signals to evoke positive responses of attention, concentration, readiness, and relaxation for study and performance. The six tape album was chosen from the Monroe Institute library and is described as producing the supportive responses for *Progressive Accelerated Learning (PAL)* in an executive context. These tapes are *Concentration*, *Retain-Recall-Release*, *Morning Exercise*, *Catnapper*, *Deep 10 Relaxation*, and *Midsummer Night*, which provide a blended variety of signals for encoding various responses to affect desired performance in training, sleep, and other activities. The tapes focus attention on given topics, while the student remains aware and relaxed. Selected mixes of sound frequencies, music, and “voice-over” instructions are specifically designed for the tapes.

A tape usage schedule for the test class was proposed to assure a reasonably acceptable level of use for this study. The *Concentration* tape was to be used during study sessions before actual testing. The *Concentration* tape probably needed to be used at least three times before each of four test sessions with the *Retain-Recall-Release* tape. Students were not directed to use the tapes as volunteer participants, but they were encouraged to follow the proposed schedule to profit from potential benefits in performance. When students commented that they were satisfied with the results of any particular tape in achieving improved performance, they were to be advised they can continue any tape use at their own discretion. Tape use, however, was suggested to continue at a minimal level through the study session for the “10-week” test, concluding the evaluation sequence. Questionnaires were given as applied to the test and control groups. Besides a special Soldier Support Center (SSC) study coordinator and selected DINFOS professional personnel, a Monroe Institute monitor was to be made available to answer study questions and interpret experiences. Students were encouraged to use the tapes according to the procedures given below and were instructed as well with tape descriptions.

Procedures

The *PAL* exercises and techniques require that you (student) do two basics. First, listen to a set of *PAL* stereo cassette tapes on a regular, scheduled basis. You need to hear them on stereo headphones in order to have them work effectively. The tapes contain Hemi-Sync sounds, an

instructional voice, and even music to help you get the full effect of the different patterns, and to remember how to use them. Second, you need to become completely familiar with the Hemi-Sync exercises. There are six *PAL* cassettes and you need to experience them on a continual basis to encode the relevant cues and gain the most from signals and instructions. The suggested use for each tape is made, although all tapes can affect enhanced performance to some degree depending on individual awareness and need.

In this study you can orient yourself to tape use by these simple guidelines.

1. For *Concentration* you can use it to better focus attention while studying, reading, writing, and reviewing visual material to improve comprehension. This tape is the **ONLY** tape that can be used in a state of full consciousness, where task attention is required, e.g. driving. It is a key approach to better learning results, and should be used during study sessions, composition, and other task behaviors needing full attention.

2. Encoding cues in *Retain-Recall-Release* assist accessing and storing information for memory to be used for your own chosen purposes. This tape is probably best used before and after study, composition or some task requiring specific knowledge. Also it can be applied after task performance to help assimilate acquired information and use for later task needs.

3. As a daily planning technique, *Morning Exercise* can help you organize your day's activity to encourage more productive and highly successful experiences. This tape is probably best used to mentally and physically prepare for your daily task objectives and schedule in a coherent fashion.

4. When a "recharge" is needed to recover from lost sleep or fatigue the *Catnapper* can provide the needed relief. It will reduce anxiety before exams, meetings and briefings. It makes a helpful study break to regain energy for increased task performance. It can change a pattern of insomnia when there is undue anxiety. Use night or day for immediate results.

5. For deep states of mental and physical relaxation *Deep 10 Relaxation* will offer reduction that gives added support for study, other task performance, and preparing to engage in creative thinking and activities. It is a helpful tape to redirect decision-making blocks or problem-solving issues. This tape is to be used whenever the time and events may so indicate your need.

6. Inspiring meditative music in *Midsummer Night* can slow excess mental activity. Along with stress reduction this tape gives unique opportunities for relaxation and heightened creativity through mental release and imagery. This tape may assist to prepare for those tasks responding best to a "fresh" approach and creative urge.

The Test Class (PAOC 1-91) students met the DINFOS selection requirements for an officer level course, which requires fundamental abilities and training to expect to achieve fully satisfactory proficiency in the course dealing with public affairs and communication media. Resources needed to conduct this study were in the form of several supporting DINFOS professional personnel and faculty, an adequate number of stereo players, headphones, and the given Hemi-Sync tapes.

The current subject-matter tests and related exercises were accepted to record the degree of individual and class training achievement. The end-of-course questionnaire had a questionnaire inventory added to account for course and personal reactions to the Hemi-Sync tapes. The inventory portion of the end-of-course evaluation dealt with nine question areas to help determine

how the tape use may have affected course performance. Comparisons were planned for both internal and external test class and control groups to better estimate the performance effects attributable to the tapes. Percentages of test group responses, the chi-squared (X^2) statistic and correlation measure for significant differences were applied in the data analysis.

RESULTS AND DISCUSSION

While class attrition was not a serious problem as in the enlisted broadcasting course (BBC 1-83), 22 of the 23 volunteer officer and select civilian students of PAOC 1-91 participated for test and exercise data and were limited finally with 14 to 16 responses collected per question for questionnaire analysis. Due to several students choosing not to submit complete questionnaire responses and materials, only sufficient records for 14 to 16 test group students could be analyzed for study purposes. Under the circumstances the sample will give an adequate basis for a reasonable number of worthwhile data observations. A strong point in this study may be that a sample group was evaluated under stressful circumstances rather than trying to draw inferences from a number of widely differing single student examples. Even though the *PAL* tapes are available through commercial distribution and have proven successful in a self-development format, utilizing the tapes in a highly structured training situation appeared to warrant this study effort.

Test Objective 1

As a class PAOC 1-91 appeared to have done as well as or even a little better than preceding Public Affairs classes. This class overall received 93.02 ($N=44$) as the grade-point average (GPA), while the two immediately prior classes received 92.52 and 92.12, respectively. It is not really possible to attribute the slight GPA increase to the effects of the testing process for the Hemi-Sync tapes. Both the test ($N=22$) and control ($N=22$) groups did increase with 93.18 (test) and 92.86 (control) over the prior classes. Some key data suggested that the auditory guidance (Hemi-Sync) process did contribute to increasing and augmenting subject-matter learning for the test group. On the four subject-matter tests or examinations on the major course areas the test group did exceed the control in all four cases if only very slightly (93.91/92.36; 92.04/88.86; 87.18/85.36; and 94.27/93.54). The probability of this occurring is significant statistically using chi-squared in that it would only occur by chance less than five times out of 100 for such groups ($X^2 (1, N=4) = 4.00, p < .05$).

Next, GPAs were compared for the principal subject-matter areas of Journalism, Broadcasting, Public Affairs, and Service Unique where the related training exercises are implemented. Only an extremely slight increase could be observed for the test vs. the control group in three of four comparisons (88.95/88.90; 96.72/96.52; 96.09/95.47; and 93.68/94.96); the observed difference was not significant ($X^2 (1, N=4) = 1.00, p > .05$). It could be instructor observation and subjectivity played a more direct role in this training aspect with greater emphasis on prior "service unique" experience and with civilian test group students being less experienced. The end-of-course questionnaire inventory did offer some related measures as a comprehensive perspective. Test students ($N = 14$ to 16) indicated that they felt the tapes helped them achieve the course objectives. Although a few (4) did not feel the tapes helped, 12 did report they were helped which was statistically significant, and it would be expected that this difference would occur by chance less than five times out of 100 such measures ($X^2(1, N=16) = 4.00, p < .05$). Even though

not statistically significant it is of practical importance to note that a distinct majority believed the tapes helped performance in the instructional areas of Media Relations (66%), Community Relations (66%), and Command Information (67%).

Even where there were almost as many students reporting they were “not helped at all,” several still indicated some degree of their performance being helped. Where the GPA for the Service Unique subject-matter area mentioned above was in favor of the control group, 53% of the responding test group did not experience help in performance from the Hemi-Sync tapes. This could suggest that though several were helped (47%) the tapes’ effects were not particularly augmenting enough to let them exceed the control group in this specialized performance. One may observe here that such advanced students with higher skills proficiency are less likely to show little if any noticeable change, other than variously augmented experiences where they have heightened awareness of subject matter, psychological processes, and specific task performance. The first test objective, then, had further modest but favorable support as the test group showed 63% believed the tapes improved or did not restrict their GPA. A generalized summary indicated that nearly 67% or six of nine instructional areas were improved and augmented for test students using the tapes.

Test Objective 2

Other learning experiences were positively affected to some degree by the use of the Hemi-Sync process as reflected by training exercises and related measures. The end-of-course questionnaire inventory provided data about this PAOC that involved training exercise experience and related measures. An overview showed a positive evaluation for the course, with test students (75%) reporting the course demands or difficulty required the expected level of effort, and was statistically significant ($X^2(1, N=16) = 4.00, p < .05$). Depending on one’s orientation toward estimating the difficulty of Public Affairs test sessions, 87% of the student responses ranged from “neither difficult nor easy to very difficult.” This may show a positive evaluation of the course’s subject-matter content and training exercises, since a school will seem more academically challenging and productive if training is not considered “easy.” The above difference would be expected to occur by chance less than one time out of 100 such measures for such a group ($X^2(1, N=15) = 8.07, p < .01$). Journalism assignments were perceived by 93% of the students experiencing the Hemi-Sync tapes as “neither difficult nor easy to very difficult,” supporting the challenging training evaluation also, a difference which would occur less than one time out of 1000 by chance alone ($X^2(1, N=15) = 11.27, p < .001$).

Nearly 78% or seven of nine course task performances were indicated by majority ratings as improved or positively affected for the Hemi-Sync test students. The tasks of “Memorizing,” “Studying,” and “Taking tests” were most favorably affected with a majority of 73%, 71% and 67%, respectively, indicating improved task performances. The least positively affected tasks, “Researching” (33%) and “Managing time” (50%) still experienced limited degrees of improved performances. “Writing,” “Managing stress,” “Speaking,” and “Planning/goal setting,” respectively, showed positive majority ratings of change of 60%, 60%, 54%, and 53%.

Test Objective 3

Other positive behavioral experiences were activated by the Hemi-Sync process as reflected by training exercises and other related measures. The specific tapes seemed to produce supportive behavioral conditions and states of awareness. Nearly 67% or four of six of the tapes affected positive majority responses with only two giving an indication of “no help at all” for some during the course. Two tapes were analyzed as being decidedly helpful with the test students. The *Concentration* and *Catnapper* tapes proved statistically significant with 80% indicating *Concentration* and 86% indicating *Catnapper* as providing help through positive behavioral experiences. These tapes offered a degree of help in the PAOC which could be expected to occur by chance less than five times out of a 100 (*Concentration*; $X^2(1, N=15) = 5.40, p < .05$) and one time of 100 (*Catnapper*; $X^2(1, N=14) = 7.14, p < .01$).

Positive behavioral experiences associated with the tape use were activated in relation to improved test student responses for instructional areas and task performances which affected training exercise results. Responses to the questionnaire inventory have confirmed some related measures which reflected test student ratings reporting their positive behavioral awareness and performance reactions. Where the test students responded to whether they experienced any unusual mental and/or physical changes during tape use, 25% reported that they did. The significant difference was in favor of not having such experience, in that it would occur by chance less than five times out of a 100 such measures ($X^2(1, N=16) = 4.00, p < .05$). But in spite of this difference for not having an experience, it is also operationally significant that some students can experience unusual changes that are personally inspiring.

Through the study numerous student discussions and comments were exchanged suggesting a largely positive behavioral experience with the Hemi-Sync tapes. Those officer and civilian students participating have individually reported that the Hemi-Sync tapes gave them the sensation of being able to do more in less time and to organize assignments more efficiently. No mention was ever made of tapes adding to the course’s learning difficulty, but improved study effort and relaxation did seem to result in the test group students. Because of the course effort and assorted time conflicts most of the students did not utilize the full six tape album. Several tapes were largely rated as “not at all” helpful or assisting study improvement. This may not indicate tapes were ineffective. It may mean the tapes were not used enough to evaluate them accurately or they did not help performance already at a superior level. Generally, attention and readiness to perform assigned tasks were described as more focused to augment task efficiency. Where a few test students reported negative reactions, they were counteracted by revised tape use and alleviating personal psycho-physical symptoms.

At the end of the PAOC test students (N=16) expressed a substantial relationship between their overall positive evaluation of the course and their belief that the Hemi-Sync tapes improved their overall GPA. The Pearson correlation ($r = .59, p < .01$, being statistically significant, would be expected to occur one time out of 100 by chance for such a group. This validated in part the belief that Hemi-Sync tape effectiveness and course values were related, so that if test students were positive toward course achievement they were also tending to experience positive tape results.

RECOMMENDATIONS

To a certain extent this study was undertaken with calculated risk. There was some apparent healthy skepticism among faculty and staff owing it seemed to a few personal reservations about such a study for some unknown reasons. But that constraint was recognized and addressed because the best of institutions is not a haven for orthodoxy and passive acceptance. Next student volunteers were requested, possibly making participation suspect for reasons pro and con. Lastly, the study was not designed to deliberately compel student motivation and compliance, as though it was an extension of the PAOC itself, since that could well induce student/faculty acquiescence to endorse the tapes.

Results were left to finding out what students might independently respond to where their own needs and awareness guided them. In spite of such limitations presented student test reactions were independently evolving and undue experimenter affect and faculty counseling did not seem to intervene to make the study turn into an unqualified "controlled" success. The tapes did seem to work for students in self prescribed amounts. A reader must recall also that these tapes do have essentially the potential to evoke the experiences described in the given album. A user must be willing to listen to tapes from a basically non-adversarial role. "The audio stimulus which creates this state (Hemi-Sync) is not overpowering. It is not invasive and can easily be disregarded either objectively or subjectively." Primarily self-selected students can listen to tapes with varying degrees of responsiveness, depending on their priority of needs and sufficient temporal and spatial considerations.

In summary the Hemi-Sync tapes fulfilled several academic and personal needs as test students progressed through their training. Where the tapes were satisfactorily applied with a range of success, it was noted that those students with stated interest or need appeared to benefit most. Those who volunteered to resolve some curiosity may have profited only by an accidental foray into some aspect of altered consciousness. Advantages of using an instructional test class revealed where obvious problems might occur in adapting the *PAL* Hemi-Sync album for training support. Students were ready to express opinions about the tapes and may have accrued additional benefits had more faculty and staff been quietly supportive during the test program. It is recommended that when feasible the tapes can be used in a training context with added emphasis on counseling or self development "coaching" to make individual and course training objectives fully complementary. As in the earlier enlisted BBC (1-83), the tapes probably can derive the optimal individual training value used in a self-development counseling process. The general applicability of the tapes in training or management will assure greater utility as efforts are made to address specific individual needs in the group context.

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